

CLAIMS

1. A punching unit, comprising a plurality of punches and dies for punching holes in a sheet type member to be punched, a reciprocating member capable of reciprocating in a direction orthogonal to a moving direction of said punches, and a plurality of cams and followers engaging with said cams, interposed between said reciprocating member and said plurality of punches, for converting the reciprocating movement of said reciprocating member to a vertical movement of said punches to punching and non-punching positions; wherein

said plurality of punches are grouped into a first group composed of a predetermined number of punches and into a second group containing any one of the punches of said first group and having a less number of punches than the predetermined number of punches of said first group; and

a punching state of the predetermined number of punches is produced by reciprocating said reciprocating member within a first movable range and by vertically moving the punches of the said first group through an intermediary of said cams and followers corresponding to the punches of said first group and a punching state of the less number of punches than the predetermined number of punches is produced by reciprocating said reciprocating member within a second movable range and

by vertically moving the punches of said second group through an intermediary of said cams and followers corresponding to the punches of said second group.

2. The punching unit as set forth in Claim 1, wherein said first movable range is a range to which said reciprocating member reaches in advancing in one direction from a home position with respect to a main frame and said second movable range is a range to which said reciprocating member reaches in advancing in the other direction from the home position.

3. The punching unit as set forth in Claim 2, wherein first and second neutral positions are provided on the opposite side from the home position respectively in said first and second movable ranges at the positions interposing the home position therebetween; and

    said reciprocating member vertically moves said plurality of punches as said first group or as said second group in reciprocating in said first or second movable range.

4. The punching unit as set forth in anyone of Claims 1 through 3, wherein said first group is composed of three punches arrayed at a predetermined pitch and a common punch in said first group that may be commonly used also in said second group is positioned at the center among said three punches; and

    said second group is composed of said common punch

and a punch dedicated for punching two holes and disposed between the punch positioned at one end among said three punches and said common punch.

5. The punching unit as set forth in Claim 4, wherein said cam corresponding to said common punch is provided with, continuously via a linear portion, a first V-shaped portion capable of moving said common punch from the non-punching position to the punching position when said reciprocating member moves in one direction and a second V-shaped portion capable of moving said common punch from the non-punching position to the punching position when said reciprocating member moves in the other direction.

6. The punching unit as set forth in Claim 1, wherein said first movable range is a range to which said reciprocating member reaches in advancing by one step in one direction from a home position with respect to a main frame and said second movable range is a range to which said reciprocating member reaches in advancing further by one step in one direction from said first movable range.

7. The punching unit as set forth in Claim 6, wherein first and second neutral positions are provided in order from said home position in said first and second movable ranges provided sequentially in said one direction from said home position; and

said reciprocating member vertically moves said plurality of punches as that of said first or said second group in reciprocating in said first or second movable range.

8. The punching unit as set forth in Claims 7, wherein said first group is composed of three or more punches arrayed at a predetermined pitch; and said second group is composed of at least two punches among the punches in said first group.

9. The punching unit as set forth in Claim 1, further comprising move restricting means for restricting said reciprocating member from moving to the movable range on the opposite side in using said reciprocating member in said first or second movable range.

10. The punching unit as set forth in Claim 9, wherein said move restricting means is a stopper for blocking the move of said reciprocating member at a predetermined position with respect to said main frame.